

1 1. An apparatus for voice activated control of an electrical
2 device, the apparatus comprising:

3 receiving means for receiving at least one audio command
a) 4 generated by a user, the at least one audio command having a command
5 word portion and a pause portion, each of the audio command portions
6 being at least one syllable in length;

7 speech recognition data having a command word portion and a
8 pause portion, each of the speech recognition data portions being at least
9 one syllable in length;

10 speech recognition means including a Hidden Markov Model
11 for comparing said command word portion and said pause portion of said at
12 least one received audio command with said command word portion and
13 said pause portion, respectively, of said speech recognition data, said
14 speech recognition means generating at least one control signal based on
15 said comparison, said speech recognition means prevents operation of the
16 electrical device when the spectral content is dynamic;

17 means for analyzing the pause portion of the received audio
18 command for spectral content; and

19 power control means for controlling power delivered to
20 an electrical device, said power control means being responsive to said at
a 21 least one control signal generated by said speech recognition means for
22 operating the electrical device in response to said at least one audio
23 command generated by the user.

1 ²~~3~~. The apparatus of claim 1, wherein said receiving means receives
2 background noise data in conjunction with said audio command, and further
a 2 3 comprising means for generating a command word score and a background
4 noise score based on the comparison of the received audio command to the
5 speech recognition data and the background noise data, respectively, said
6 speech recognition means generating said at least one control signal when
7 said command word score exceeds said background noise score.

1 ³~~4~~. The apparatus of claim ²~~3~~, and further comprising:
2 means for analyzing the command word portion of the
3 received audio command and the background noise data for energy content;
4 and

5 means for comparing the energy content of the command word
6 portion to the energy content of the background noise data and generating a
7 corresponding energy comparison value;

8 wherein said speech recognition means prevents the generation
9 of said at least one control signal when said energy comparison value is
10 below a predetermined level.

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1 ⁴~~5~~. The apparatus of claim 1, wherein said receiving means receives
2 background noise data in conjunction with said audio command, and further
3 comprising:

4 means for analyzing the command word portion of the receive
5 audio command and the background noise data for energy content; and

6 means for comparing the energy content of the command word
7 portion to the energy content of the background noise data and generating a
8 corresponding energy comparison value;

9 wherein said speech recognition means prevents the generation
10 of said at least one control signal when said energy comparison value is
11 below a predetermined level.

1 ⁵~~6~~. The apparatus of claim 1, wherein each of said at least one audio
2 command and said speech recognition data comprises first and second
3 command word portions separated by said pause portion and further
4 comprising a second pause portion having one syllable in duration before
5 said first command word portion and a third pause portion having one
6 syllable in duration after said second command word portion.

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1 ⁶~~7~~. The apparatus of claim 1, wherein the speech recognition means
2 further including a microcontroller with a fixed-point embedded
3 microprocessor, the microprocessor is chosen from the group of 8-bit and
4 16-bit micro controller unit_microprocessors.

1 ⁷~~8~~. A method of activating an electrical device through at least one
2 audio command from a user, the method comprising the steps of:

3 recording speech recognition data having a command word portion
4 and a pause portion, each of the speech recognition data portions being at
5 least one syllable in length;

6 receiving at least one audio command from a user, the at least one
7 audio command having a command word portion and a pause portion, each
8 of the audio command portions being at least one syllable in length;

9 comparing said command word portion and said pause portion of said
10 at least one received audio command with said command word portion and
11 said pause portion, respectively, of said speech recognition data;
12 generating at least one control signal based on said comparison;
13 controlling power delivered to an electrical device in response to said
14 at least one control signal for operating the electrical device in response to
15 said at least one received audio command;
16 analyzing the pause portion of the received audio command for
a2 17 spectral content; and
18 preventing operation of the electrical device when the spectral content
19 is dynamic.

1 ~~9~~⁸. The method of claim ~~8~~⁷, wherein the step of recording speech
2 recognition data includes recording the voice of a user while the user
3 utters said at least one audio command.

1 ~~10~~¹⁰~~12~~. The method of claim ~~8~~⁷, and further comprising:
a3 2 ascertaining a first energy content for the command word portion
3 of the received audio command;

4 ascertaining a second energy content for the received background
5 noise data;
93 6 comparing the first and second energy contents and generating an
7 energy comparison value; and
8 preventing the generation of said at least one control signal when
9 said energy comparison value is below a predetermined level.

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16. The apparatus of claim ⁷~~8~~, wherein each of said at least one audio
a4 2 command and said speech recognition data comprises at least first and
3 second command word portions separated by said pause portion.

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17. The apparatus of claim ¹²~~14~~, and further comprising a second pause
2 portion having one syllable in duration before said first command word
3 portion and a third pause portion having one syllable in duration after a
4 second command word portion.

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27. A method of activating an electrical device through at least one
a5 2 audio command from a user, the method comprising the steps of:

3 recording speech recognition data having a command word portion
4 and a pause portion, each of the speech recognition data portions being at
5 least one syllable in length;

6 receiving at least one audio command from a user, the at least one
7 audio command having first and second command word portions and a first,
8 second and third pause portions, each of the audio command portions being
9 at least one syllable in length,

10 said second pause portion having one syllable in duration before said first
11 command word portion and said third pause portion having one syllable in
12 duration after said second command word portion;

13 comparing said command word portion and said pause portion of said
14 at least one received audio command with said command word portion and
15 said pause portion, respectively, of said speech recognition data;

16 generating at least one control signal based on said comparison;

17 controlling power delivered to an electrical device in response to said
18 at least one control signal for operating the electrical device in response to
19 said at least one received audio command.